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INCIDENCE AND DEADWEIGHT LOSS FROM SUPERANNUATION GUARANTEE CHARGE

by

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Superannuation has had a long history in Australia. In 1862, the Bank of New South Wales introduced a pension scheme for employees. For the next hundred years, coverage of superannuation remained patchy. It remained as a benefit for the managerial staff. In its first survey of superannuation, the Australian Bureau of Statistics (ABS) found only 32% of all workers were covered by superannuation in 1974. Even in 1988, only 45% of all full-time employees had any superannuation. For part-time employees, the figure was below 10%. In 1987, Australian Industrial Relations Commission (AIRC) received superannuation as a part of total renumeration over which it had jurisdiction in wage cases. The Hawke Labor Government, with a strong push from the Australian Congress of Trade Unions (ACTU), agreed to introduce superannuation of 3% in the 1988 Accord. In 1991, the Government decided to make superannuation *compulsory* as part of renumeration package for all workers, not just the workers covered by the Award wages. As a result, on July 1, 1992, the Superannuation Guarantee Charge (SGC) became an integral component of the Federal Government's long-term program of retirement policy.

The SGC affects, in large part, a number of political events and influences. Economic consequences of such a momentous change have not been fully debated or understood. This paper investigates the economic consequences of the SGC. Specifically, we investigate two questions in this paper: (1) Who bears the burden of SGC? (2) What is the (welfare) cost of such a tax? These are not idle questions. In 1991-92, Business Council of Australia (BCA) made several submissions to the Senate Select Committee on Superannuation and lobbied strongly against the introduction of SGC. The Business Council argued that the burden of SGC will be borne by businesses and it will reduce employment. This employment reduction argument was investigated by Sinha (1944). The question of the burden of tax and the consequent welfare cost in terms of deadweight loss has not been investigated before.

There are several ways of looking at superannuation. Here, we will concentrate on the aspect of superannuation as a tax. Curiously, the policy makers have been reluctant to call superannuation a tax. At first,

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superannuation was dubbed a levy. Later, it was called a charge. However, since it is implemented as a compulsory payment for (almost) all workers in Australia, it is a tax even though the Government does not call it a tax (see Sinha and Benedict 1994).

SGC tax rates

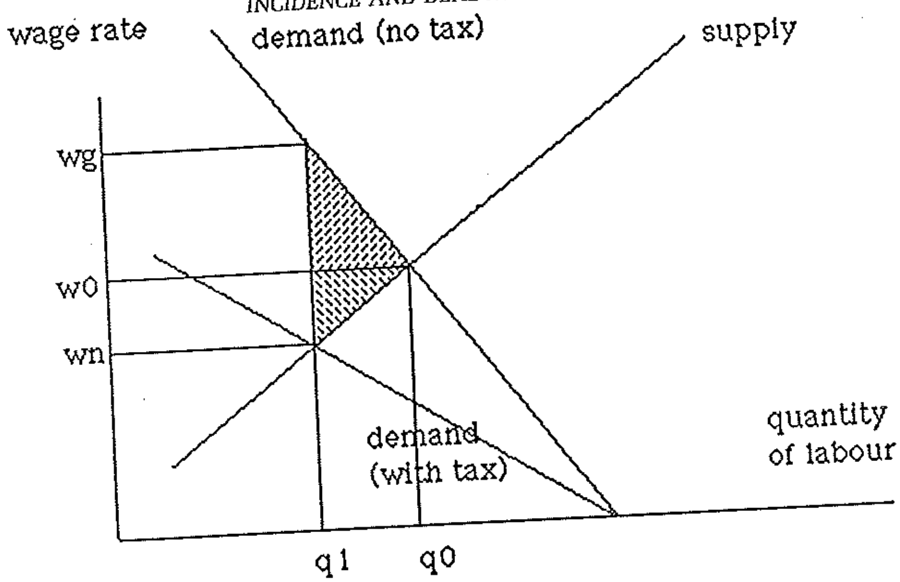
For companies with a payroll less than $1m, the prescribed schedule was 3% until 30 June 1994. Then, over the next decade, it gradually increases to 9% by 2003.

There is a provision for an additional 3% tax to be levied on the employees some time in the future (however, the exact date has not been set yet). The SGC is a *proportional* tax (rather than a *unit* tax) that initially starts at 3% and then gradually rises to 9% (and probably to 12%). Such a tax has been dubbed a G-Policy by Hamermesh (1993).

A simple model

We can treat the Superannuation Guarantee Charge as a tax on labour. To determine who bears the burden of a tax we can either view the tax by shifting the demand curve down or shifting the supply curve up. The net result is the same regardless of on whom the tax is initially placed (see, for example, Holcombe (1988), Chapter 9). We will use this equivalence and simply concentrate on a tax viewed from the demand curve (as in Figure 1). Therefore, it makes no difference economically whether the tax is legislated to be imposed on the employer or the employee.

FIGURE 1
INCIDENCE AND DEADWEIGHT LOSS



In general, such a tax will raise the wages paid out by employer (from w0 to wg in Figure 1) and reduce the take home pay for the employee (from w0 to wn in Figure 1). There will be a reduction in the level of employment. However, the exact nature of the burden will critically depend on the supply and demand elasticities of labour.

If labour supply curve is vertical, then w0 = wg. In that case, employees bear 100% of the tax. For full-time workers, evidence suggests that the labour supply curve is vertical or near vertical.

What is the deadweight loss (or excess burden) of such a tax? It is clearly the shaded region given in Figure 1. Bishop (1968) has demonstrated that the value of the deadweight loss of a tax is given (approximately) by the following expression:

$$\text{deadweight loss} = w_0 . q_0 . t_b^2 / 2A \qquad (1)$$

where A = 1/supply elasticity + 1/demand elasticity,
t_b = the tax rate,
w_0 = the price before tax,
and q_0 = the equilibrium quantity before tax.

In what follows, we will use this formula to estimate deadweight loss due to SGC.

Supply and demand: compensated versus uncompensated elasticities

The application of equation (1) is clearly dependent on estimates of demand and supply elasticities. Unfortunately, there are several problems associated with the estimation of such elasticities.

First, conceptually, a distinction needs to be made whether we are estimating uncompensated (or Marshallian) demand/supply or compensated (or Hicksian) demand/supply. However, Willig (1976) has shown that most of the time, when the tax rates are less than 50%, the estimates of deadweight loss from uncompensated and compensated demand/supply curves do not differ by much (less than 5%). Therefore, for our purposes, we can concentrate on uncompensated demand/supply curves.

Second, even for a given country, and a given time period, many different (and distinct) values of demand/supply elasticities have been obtained by different researchers. One reason for it is the level of disaggregation of data. The finer the disaggregation, the more the variation in the estimates among different groups of workers.

Estimates of elasticities

Hamermesh (1993) discusses the difficulties in estimating elasticities in the labour market. Norris (1993, p. 33) speculates that elasticity of supply of labour is zero for male full-time workers and 0.4 for female and part-time workers in Australia. For labour demand, Hamermesh (1986) estimates it for the US labour market to be from −0.15 to −0.50. Using a new methodology, Kirby and Lewis (1988) estimate the long-run demand elasticity to be around −0.8. Using Australian data, Phipps (1986) estimated labour demand for different industries, ranging from −0.15 to −0.50. He finds the aggregate labour demand elasticity to be −0.25.

We will assess the impact of such a tax on the labour market. There will be two different kinds of impact: (1) on the level of equilibrium employment (which we will measure in hours of labour per year) and (2) on the wage rate the workers receive and the wage rate the firms pay out (and the tax will be a wedge between the two wage rates).

Deadweight loss due to SGC

From the previous discussion, it is clear that there are no agreed estimates of either demand elasticity or supply elasticity of labour. Wage rates vary across occupation and gender; number of hours worked per person per year differs; the SGC rates will increase over time.

Therefore, to see the consequences clearly, we perform a number of simulations of the welfare cost by assuming different values for the supply elasticity (0.1, 0.5, 0.8) and at the SGC rate (3%, 9%, 12%). We also assume a before-tax wage rate per hour of $17, an infinite demand elasticity, and that part-time workers work 1000 hours per year and full-time workers 2000 hours per year.

TABLE 1

DEADWEIGHT LOSS PER WORKER PER YEAR TO SGC

Supply elasticity	Tax rate = 3%	9%	12%
0.1	$1.53	$13.77	$24.48
0.5	$7.65	$68.85	$122.40
0.8	$12.24	$110.16	$195.84

Assumptions: number of hours worked = 2000 hours per year; wage rate = $17 per hour; demand elasticity is infinite.

As at February 1994, there were 4,460,600 male workers of whom 4,009,400 worked full-time and 451,200 worked part-time. Average weekly total earnings for full-time (adult) male workers were $690.00. There were 3,291,500 female workers, of which 1,940,300 worked full-time and 1,351,200 worked part-time. Average weekly total earnings for a full-time (adult) female worker were $551.60.

We know that average full-time adult workers work 35-40 hours a week. Therefore using the earnings figures above, we estimate *before-tax* average income per hour to be $15-$20. We use these figures for our simulations for generating values of the deadweight loss using equation (1).

In table 1, we have used an infinite supply elasticity. Equation (1) is symmetric in supply and demand elasticities. Therefore, we can easily calculate the deadweight loss for any combination of demand and supply elasticities. For example, if the demand elasticity is −0.5 and the supply elasticity is 0.8, the deadweight loss will be $68.85 + $110.16 = $179.01 for an SGC tax rate of 9%.

Using these figures, we find the deadweight loss ranges between $200 and $400 per worker per year for 9% to 12% tax rates. Now, using the figures for part-time and full-time male and female workers, we estimate the welfare cost due to SGC to be between $900 million and $1.9 billion per year.

Some general equilibrium considerations

The model for which we have calculated the deadweight loss is a partial equilibrium model. Clearly, this result will hold only if other variables do not change. For example, we have not changed any other factor of production in our model. The only factor considered is labour. Had we specified a model where other factors are endogenised (such as in Feldstein (1974)), we would have been be able to study the interaction between factors.

In the long run, the economy moves through dynamic adjustments. These adjustments are not accounted for in our model either. Nevertheless, it could again be justified on the basis of simulations conducted by Feldstein (1974). He concluded using general equilibrium models that the movement from one equilibrium to another can take a very long time (fifty years or more, depending on the exact model specifications). Therefore, our calculations based on partial equilibrium model could be a reasonable first approximation.

Implications

A tax on labour has two important implications from an economic point of view: first a reduction in the equilibrium quantity of labour due to the tax and second deadweight loss due to the tax. We can measure the first implication via an opportunity cost argument. Additional tax on labour increases unemployment. Additional unemployment has two sets of macroeconomic costs to government: increased payment of unemployment benefits and foregone income tax government would have collected had they been employed. Sinha (1994) gives estimates of these costs. He finds that the cost is about 25% to 50% of the age pension. However, he does not estimate the deadweight loss. Here, we fill in that gap by estimating the costs in terms of deadweight loss. Given the current expenditure on age pension is around $10 billion, deadweight loss is between 9% and 19% of age pension.

Conclusion

The issue of the burden of the SGC was first raised by Sinha (1994). As the starting point, he investigates the increased unemployment induced by the SGC. He then calculates the revenue lost to the government what SGC induced unemployed workers would have paid in the form of income taxes.

Given that labour demand elasticity is low and labour supply elasticity is low for full-time workers and not so low for part-time workers, we conclude that for full-time workers, the burden of SGC is borne mainly by workers. On the other hand, part of the cost relating to part-time workers is passed on to the employers.

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